WHAT IS CLAIMED IS:

1. A pharmaceutical composition comprising a recombinant MVA virus expressing an HIV *env*, *gag*, and *pol* gene or modified gene thereof for production of an HIV Env, Gag, and Pol antigen by expression from said recombinant MVA virus, wherein said HIV *env* gene is modified to encode an HIV Env protein composed of gp120 and the membrane-spanning and ectodomain of gp41 but lacking part or all of the cytoplasmic domain of gp41, and a pharmaceutically acceptable carrier.

2. The pharmaceutical composition of claim 1, wherein said HIV *pol* gene or modified gene thereof is modified to inactivate reverse transcriptase and integrase.

3. The pharmaceutical composition of claim 1, wherein said HIV *env*, *gag*, or *pol* gene or modified gene thereof is taken from clade A.

4. The pharmaceutical composition of claim 1, wherein said HIV *env*, *gag*, or *pol* gene or modified gene thereof is taken from clade B.

5. The pharmaceutical composition of claim 1, wherein said HIV *env*, *gag*, or *pol* gene or modified gene thereof is taken from clade C.

6. The pharmaceutical composition of claim 1, wherein said HIV *env*, *gag*, or *pol* gene or modified gene thereof is taken from clade D.

7. The pharmaceutical composition of claim 1, wherein said HIV *env*, *gag*, or *pol* gene or modified gene thereof is taken from clade E.

8. The pharmaceutical composition of claim 1, wherein said HIV *env*, *gag*, or *pol* gene or modified gene thereof is taken from clade F.

9. The pharmaceutical composition of claim 1, wherein said HIV *env*, *gag*, or *pol* gene or modified gene thereof is taken from clade G.

10. The pharmaceutical composition of claim 1, wherein said HIV *env*, *gag*, or *pol* gene or modified gene thereof is taken from clade H.

11. The pharmaceutical composition of claim 1, wherein said HIV *env*, *gag*, or *pol* gene or modified gene thereof is taken from clade J.

12. The pharmaceutical composition of claim 1 wherein said HIV *env*, *gag*, or *pol* gene or modified gene thereof is inserted at the site of deletion III within the MVA genome.

13. The pharmaceutical composition of claim 1 wherein said HIV *env*, *gag*, or *pol* gene or modified gene thereof is under transcriptional initiation regulation of a H5-like early/late vaccinia virus promoter.

14. The pharmaceutical composition of claim 1 wherein recombinant MVA virus additionally expresses an additional HIV gene or modified gene thereof for production of an HIV antigen by expression from said recombinant MVA virus, wherein said additional HIV gene is a member selected from the group consisting of *vif, vpr, tat, rev, vpu*, and *nef.*

15. MVA/HIV48 comprising SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, and SEQ ID NO:5.

16. pLW-48 having SEQ ID NO:1.

17. A plasmid transfer vector having the sequence of pLW-48 (SEQ ID NO:1) excluding the HIV *env*, *gag*, and *pol* genes.

18. pLW-48 (SEQ ID NO:1) wherein the HIV *env*, *gag*, and *pol* genes have a sequence taken from another clade.

19. A poxvirus comprising a promoter selected from the group consisting of m7.5 promoter having SEQ ID NO:10, Psyn II promoter having SEQ ID NO:2, Psyn III promoter having SEQ ID NO:11, Psyn IV promoter having SEQ ID NO:12, and Psyn V promoter having SEQ ID NO:13.

20. A method of boosting a $CD8^+$ T cell immune response to an HIV Env, Gag, or Pol antigen in a primate, the method comprising provision in the primate of a composition of any of claims 1-15, whereby a $CD8^+$ T cell immune response to the antigen previously primed in the primate is boosted.

21. The method of Claim 20, wherein the primate is a human.

22. The method of Claim 20, wherein administration of the recombinant MVA virus is by needleless injection.

23. A method of inducing a $CD8^+$ T cell immune response to an HIV Env, Gag, or Pol antigen in a primate, the method comprising provision in the primate of a composition of any of claims 1-15, whereby a $CD8^+$ T cell immune response to the antigen in the primate is induced.

24. The method of Claim 23, wherein the primate is a human.

25. The method of Claim 23, wherein administration of the recombinant MVA virus is by needleless injection.

26. A method of inducing a $CD8^+$ T cell immune response to an HIV Env, Gag, or Pol antigen in a primate, the method comprising provision in the primate of a priming composition comprising nucleic acid encoding said antigen and then provision in the primate of a boosting composition which comprises any of claims 1-15, whereby a $CD8^+$ T cell immune response to the antigen is induced.

27. The method of Claim 26, wherein the primate is a human.

28. The method of Claim 26, wherein administration of the recombinant MVA virus is by needleless injection.

29. The method of Claim 26, wherein the priming composition comprises plasmid DNA encoding said antigen.

30. A method of making a composition of any of claims 1-15 comprising preparing a plasmid transfer vector encoding an HIV *env*, *gag*, and *pol* gene or modified gene thereof, wherein said HIV *env* gene is modified to encode an HIV Env protein composed of gp120 and the membrane-spanning and ectodomain of gp41 but lacking part or all of the cytoplasmic domain of gp41, and recombining said plasmid transfer vector with a MVA virus to produce a composition of any of claims 1-15.